

**DRAFT Tennessee Valley Authority  
Integrated Resource Plan Stakeholder Review Group  
Working Session  
MEETING MINUTES  
January 26, 2011  
Knoxville, TN**

Members Present:

Randy McAdams, Facilitator, Scott Madden  
Lance Brown, Partnership for Affordable Clean Energy  
Richard Holland, Packaging Corporation of America  
David Reister, Environmental Stakeholder  
Jack Simmons, Tennessee Valley Public Power Association  
Stephen Smith, Southern Alliance for Clean Energy  
Lloyd Webb, Tennessee Valley Industrial Committee

Attending by Webinar:

Larry Cole, TVA  
Ryan Gooch, State of Tennessee  
Louise Gorenflo, Sierra Club  
Hank List, Commonwealth of Kentucky  
Brian Paddock, Guest, Sierra Club  
John Wilson, Guest, Southern Alliance for Clean Energy

Members Absent:

Tom King, Oak Ridge National Laboratory  
George Kitchens, Joe Wheeler Electric Membership Corporation  
David McKinney, Tennessee Wildlife Resource Agency  
Jan Simek, University of Tennessee  
Patrick Sullivan, Office of Governor Haley Barbour  
Deb Woolley, Tennessee Chamber of Commerce and Industry

Guests:

Steve Adams, Tennessee Valley Public Power Association  
Sam Gomberg, Southern Alliance for Clean Energy

TVA: Bob Balzar, Gary Brinkworth, Ed Colston, BJ Gatten, Jill Glenn, Randy Johnson, James Linder, Bob Mango, Jeff Parsley, Anda Ray, Greg Signer, Mary Carlie Vaughn, Van Wardlaw, Beth Yetter, Steve Gilbert

**I. Introduction**

Randy McAdams, Facilitator, Scott Madden  
Randy McAdams welcomed the SRG and reminded them of the IRP process and the SRG's purpose.

- Up to now, have completed the draft document and presented the draft findings; now, finishing analysis and preparing the final IRP document. At December 2010 SRG working session, viewed some preliminary results from the final analysis and will be showing more today

**II. Updated Results from Ongoing Analysis**

Gary Brinkworth, Senior Manager, Generation and Portfolio Optimization

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- In order to build to the recommended planning strategy, used components from Strategies C and E to create the boundaries meaning, the recommended planning strategy has components of both strategies
- The purpose of the IRP is not to define specific project timing or specific asset decisions that TVA may or may not make as a utility. Rather, it is the vehicle for providing boundary conditions and guidance in the annual planning process
- Approach: began with five planning strategies in the draft; retained the three that performed the best across the scenarios – these strategies defined the bounds for analysis for the final; then, utilized a blended optimization to build the recommended planning strategy – the blended optimization approach is utilized to identify key components to comprise the recommended planning strategy
- Four different coal-fired idling levels are now a defined model input – this is because this component cannot be optimized within the model. The four different levels are tested within the scenarios to observe how each performs. Different defined levels of EEDR and renewables are chosen based on the different idling levels. Then, further unit additions are selected as needed
  - o EEDR and renewables: These resources are now optimized in the model (based on different levels that the model was able to “choose” from) – have selected strategy components from optimization cases based on which performs best across the scenarios in terms of least cost and other metrics
  - o The proposed recommended planning strategy, to date, is evaluated as it was in the draft (stochastic analysis, financial analysis, etc.); then, these results are used to populate the scorecard in order to compare it to the draft strategy scorecards to ensure there is improvement from draft to final
- Next, capacity additions by scenario were shown in graphical form for Scenario 1 (high load forecast); Scenario 8 (updated forecast due to unexpected lingering recession) and Scenario 3 (low load forecast). A total of 12 cases were shown (the four idling levels intersected with each scenario). This illustrates how the different levels of idling affect what the model will choose
  - o In Scenario 1 – choosing the largest amount of options since this scenario has the highest demand compared to the others, for example
- Reviewed the financial impacts/risk ratio (same process as used in draft but re-evaluated for final)
  - o Not an attempt to predict system rate/wholesale rate/or any other rate implication, just one way to evaluate these different plans; in the immediate time period, can see affect on cash flow commitments of major unit additions
  - o Any plan that has a lot of commitment to a lot of capital intensive resources early in the model (2020) will result in poor short term rate metrics compared to plans that do not have much commitment in them
- Observations developed from preliminary analysis:
  - o Nuclear will play a role within 2018-2020 timeframe; will not play a big role in low to no load growth scenarios
  - o Coal additions won't occur unless there is dramatic load growth and, if so, will be very late in the study period
  - o Natural gas additions will occur whenever it makes cost effective sense – no constraint on the model's ability to choose, just an issue of when we will need this capacity

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- Renewables – appears that the model tends to favor lower level of renewables based on the level being chosen; have chosen to include the 1,500-2,500MW range for renewables
- EEDR – appears to be evenly split in terms of what the model is selecting between the middle level or the largest portfolio of EEDR (interesting observation – the model isn't picking the lowest level; clearly indicating that the model “wants” more EEDR than has been modeled/achieved in the past)
  - TVA recognizes increasing EEDR efforts will have significant impact on distributors and their relationships with their customers; Energy Services committee (TVPPA) is working w/ TVA on several EEDR programs

LUNCH

**III. Preliminary Recommendations and Scorecards**

Gary Brinkworth, Senior Manager, Generation and Portfolio Optimization

- Chose to use the 4,000 MW idled coal-fired capacity level as fixed assumption based on the results of the modeling analysis; model results were reviewed to identify trends for other key component choices (nuclear, coal, natural gas, renewable additions and EEDR levels)
- Reviewed the recommended planning strategy components: selection window for BLN 1 (2018-2020); allow selection of coal additions after 2025 only in extreme load cases; gas capacity allowed to be added throughout the study period; 2,500 renewables by 2020; 3,600 MW and 11,400 GWh EEDR by 2020
  - Recommended planning strategy is meant to represent where TVA is generally going; shows window of time when an asset may need to be added; as we turn crank on annual planning process(es), provides a lot more refined analysis/granularity
  - Will take this planning strategy and re-optimize across all eight scenarios and compare to draft results; will be included in the final IRP
- Next step is to calculate and score the illustrative portfolios – this shows how the recommended planning strategy performs within the various views of the future
- Looked at guideline ranges for the key components (coal-fired capacity idled, renewable additions, and EEDR portfolio)
- Identified a values to use for the scorecard - 4,000MW idled coal; 4,600 EEDR by 2029; and 2,500 MW renewables by 2029
- Showed the eight portfolios to illustrate how the recommended planning strategy could be implemented in the different views of the future
  - As you look across 8 scenarios, there are a couple of futures that don't require many resource additions until we are outside of 2015 window (near term additions) - (Scenarios 3 and 6 don't add anything – except for Board approved additions)
  - Long-term additions (5-15yrs) – nuclear expansion and more gas-fired generation
  - Coal is only added in Scenario 1 due to its high load growth

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- The result of the recommended strategy's scorecard is an improvement in ranking metrics from the draft (PVRR, plan cost, financial risk factors) and improvement in the strategic metrics for Strategy C
- Recommended planning strategy represents the lowest risk and least cost plan compared to the five strategies in the draft
- Can examine uncertainty a different way by looking at a tornado diagram; this diagram illustrates the variability of PVRR for each scenario within Strategy C, Strategy E, and the recommended planning strategy. The width of the bar indicates uncertainty around the recommended value (wider bar = more uncertainty)
  - o Expected values for most scenarios shifted to the left in the final analysis (less expensive)

**IV. Next Steps**

Randy McAdams, Facilitator, Scott Madden

Still have some sensitivity work to finish and also continuing to work on responses to draft comments

- Non-quantifiable risks are also being evaluated
- Still have work to do in terms of both the analytics and also the packaging and messaging of final results

**V. Wrap Up**

- In the process of packaging the recommended planning strategy in order to flow that into the final IRP document
- Working from the draft IRP document to refresh some of the chapters for the final IRP and add other chapters with new information on the recommended planning strategy
  - o Must be reviewed by senior management, executives and ultimately the Board
  - o Have suggested that our next session be Feb. 24 – by that point will have completed another round of internal vetting and can show how the recommendation will “look” when submitted to the Board in April 2011
  - o Will also be in position to show what the final document will look like in terms of each chapter's content
  - o Final IRP will be transmitted to the EPA early March in order to meet the 30-day waiting period required by National Environmental Policy Act (NEPA) – will be available to public for review. There is no public comment period for the final IRP
  - o All three things (stakeholder input, analysis and strategic values, and no regrets considerations) as well as TVA leadership have all helped to shape this IRP